

A	B	C	D	E	F	G	H	I	J	K
1			Retracked GDR Data Record							
2		Release 3.0	Date: 2009/06/01 T 1030	File: retrk-gdr-data-rec-r30.096.xls						
3			Concept: Basic format of TOPEX MGDR with information/data from MGDR-B with some fields replaced with new information, a few fields proposed for deletion.							
4			Retracked and TMR Replacement values appended.							
5			Retrack values from new RDR of 2009. Includes two methods of retracking: Least Squares estimate with GDR as initial values (Retrk1);							
6			Maximum A Posteriori (constrained LS) with LSE as initial values (Retrk2).							
7			TMR values from TMR Replacement Product (TRP) of S. Desai & S. Brown August 2006. Recalibration of TMR to remove yaw, land effects.							
8										
9										
10			Format has been revised to be similar to Jason-1 and easier to use in Fortran by making 4 byte alignments and avoiding unsigned integers where possible.							
11			This format is the same as that used for OSTST meeting in March 2007. Some fields (candidates indicated in comments) may be eliminated for final product.							
12			Sea State Bias (SSB) still needs to be fit to these data and then included.							
13			GCP was not used in generating this product, so some fields are not included in Rel 3.0 but will be in Rel 3.1.							
14			Header is copy of MGDR header. 33 header records same size (480B, padded with blanks) as data records.							
15										
16			Original MGDR Size + byte alignment =	228						
17			(M)GDR Size w/ Proposed Del =	224						
18			Retrk Size =	236						
19			Updated TMR Size =	20						
20			Total Size =	480						
21			Note: A few variable names have been changed from MGDR.							
22	Field Number	Start Byte	Parameter Name	Content	Type	Dim.	Size	Units	Source	Comment
23										
24	Time Tag							60		
25	1	1	Tim_Moy_1	Time, days past epoch	SI	1	2	Days	MGDR	MGDR copied from PODAAC/TOPEX
26	2	3	Tim_Moy_2	Time, msec in day	SI	1	4	10^-3s	MGDR	
27	3	7	Tim_Moy_3	Time, microsec	SI	1	2	10^-6s	MGDR	
28	4	9	Dtim_Mil	Time shift midframe	SI	1	4	10^-6s	MGDR	
29	5	13	Dtim_Bias	Net timetag correction	SI	1	4	10^-6s	MGDR	
30	6	17	Dtim_Pac	10 per sec timing	SI	1	4	10^-6s	MGDR	
31	Location									
32	7	21	Lat	Latitude	SI	1	4	10^-6 deg	New POE	New POE. GSFC std0809. See Release notes.
33	8	25	Lon	Longitude	SI	1	4	10^-6 deg	New POE	New POE. GSFC std0809. See Release notes.
34	Altitude									
35	9	29	Sat_Alt_1	Altitude above ref ellipsoid POD#1	SI	1	4	10^-3m	MGDR POE#1	Copied from MGDR POD#1 (MGDR: HP_Sat_Alt)
36	10	33	Sat_Alt_2	Altitude above ref ellipsoid POD#2	SI	1	4	10^-3m	New POE	New POE. GSFC std0809. See Release notes.
37	11	37	Sat_Alt_Hi_Rate	Difference of 10/sec sat alt from Sat_Alt_2	SI	10	2	10^-3m	New POE	
38	Attitude									
39	12	57	Att_Wvf	Waveform attitude	SI	1	2	10^-2 deg	MGDR	MGDR copied from TOPEX (changed to 2B). Retrack Att reported in Retrk section
40	13	59	Att_Platform	Platform attitude	SI	1	2	10^-2 deg	MGDR	
41	Altimeter Range							36		
42	14	61	H_Alt	One per frame (second) altimeter range	SI	1	4	10^-3m	MGDR	MGDR copied from PODAAC/TOPEX. Retracked Range in Retrack section. Items rearranged to improve byte alignment.
43	15	65	H_Alt_Hi_Rate	Difference of altimeter ranges from H_Alt	SI	10	2	10^-3m	MGDR	(MGDR: H_Alt SME.)
44	16	85	RMS_H_Alt	RMS from compression from 10 to 1 value per frame	SI	1	2	10^-3m	MGDR	
45	17	87	Range_Deriv	Range derivative	SI	1	2	10^-2 m/s	MGDR	Could be calculated from orbit (as Jason) or by TOPEX algorithm. Could also be deleted.
46	18	89	Net_Instr_R_Corr_K	Net instrument correction to range (Ku)	SI	1	2	10^-3m	MGDR	
47	19	91	Net_Instr_R_Corr_C	Net instrument correction to range (C)	SI	1	2	10^-3m	MGDR	
48	20	93	CG_Range_Corr	Center of gravity movement correction to range	SI	1	1	10^-3m	MGDR	
49	21	94	Nval_H_Alt	Number of valid points for 1 frame range	SI	1	1	/	MGDR	(MGDR description changed from "altitude" to "range" for consistency)
50			X[RMS_Range_Deriv]X	X[RMS of high rate values of Range_Deriv]X	SI	1	2	10^-2 m/s	MGDR	Delete - Not normally produced by TOPEX algorithm. Not really meaningful for orbit calculation.
51	22	95	Spare	For 4 byte alignment	BF	1	2			Added Ver 2
52	Environmental Corrections							24		
53	23	97	Dry_Corr	Dry tropo corr. - met fields interp. to measurement time	SI	1	2	10^-3m	MGDR	MGDR copied from PODAAC/TOPEX. (To be replaced w/ CNES/Jason value.)

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54	24	99	Dry1_Corr	Dry tropo correction - early met field	SI	1	2	10^{-3} m	MGDR	Should this be deleted? Will we have this for new Dry_Corr?
55	25	101	Dry2_Corr	Dry tropo correction - late met field	SI	1	2	10^{-3} m	MGDR	Should this be deleted? Will we have this for new Dry_Corr?
56	26	103	INV_BAR	Inverse barometer correction at measurement time	SI	1	2	10^{-3} m	MGDR	
57	27	105	Wet_Corr	Wet tropo corr. - met fields interplo. to measurement time	SI	1	2	10^{-3} m	MGDR	MGDR copied from PODAAC/TOPEX. (To be replaced w/ CNES/Jason value.)
58	28	107	Wet1_Corr	Wet tropo correcting - early met field	SI	1	2	10^{-3} m	MGDR	
59	29	109	Wet2_Corr	Wet tropo correction - late met field	SI	1	2	10^{-3} m	MGDR	
60	30	111	Wet_H_Rad	Radiometer wet tropo correction	SI	1	2	10^{-3} m	MGDR	Original value. Value corrected for Tb drift, antenna pattern, yaw in Retracking section, Wet_H_Rad_Corr. (*Final version will probably have only corrected value.)
61	31	113	Iono_Corr	TOPEX dual-frequency ionospheric correction	SI	1	2	10^{-3} m	MGDR	Original value. Value corrected with retracking in Iono_Retrk.
62	32	115	Iono_Dor	Ionospheric correction from DORIS	SI	1	2	10^{-3} m	MGDR	
63	33	117	Iono_Ben	Ionospheric correction from Bent model	SI	1	2	10^{-3} m	MGDR	Will be replaced by GPS iono (GIM) when available.
64	34	119	Spare	For 4 byte alignment	BF	1	2	/		
65	Significant Wave Hieght & Backscatter Coefficient								40	
66	35	121	SWH_K	Significant Wave Height (Ku)	SI	1	2	10^{-2} m	MGDR	MGDR copied from PODAAC/TOPEX. Original value. Retracked SWH (1/frame fit) in Retracking section.
67	36	123	SWH_C	Significant Wave Height (C)	SI	1	2	10^{-2} m	MGDR	MGDR copied from PODAAC/TOPEX. Original value. Retracked SWH (1/frame fit) in Retracking section.
68	37	125	SWH_RMS_K	RMS of SWH (Ku)	SI	1	2	10^{-2} m	MGDR	MGDR copied from PODAAC/TOPEX (Changed to 2 byte SI)
69	38	127	SWH_RMS_C	RMS of SWH (C)	SI	1	2	10^{-2} m	MGDR	MGDR copied from PODAAC/TOPEX (Changed to 2 byte SI)
70	39	129	SWH_Pts_Avg	Number of valid points used to compute SWH	SI	1	1	/	MGDR	
71	40	130	Net_Instr_SWH_Corr_K	Net instrument correction to SWH (Ku)	SI	1	1	10^{-3} m	MGDR	
72	41	131	Net_Instr_SWH_Corr_C	Net instrument correction to SWH (C)	SI	1	1	10^{-3} m	MGDR	
73	42	132	Spare	For 4 byte alignment	BF	1	1	/		
74	43	133	DR_SWH_Att_K	Attitude correction (Ku)	SI	1	2	10^{-3} m	MGDR	
75	44	135	DR_SWH_Att_C	Attitude correction (C)	SI	1	2	10^{-3} m	MGDR	
76	45	137	EMB_Gaspar	Electromagnetic bias correction (Ku) (Gaspar)	SI	1	2	10^{-3} m	MGDR	
77	46	139	EMB_Walsh	Electromagnetic bias correction (Ku) (Walsh)	SI	1	2	10^{-3} m	MGDR	
78	47	141	Sigma0_K	Backscatter coefficient (Ku)	SI	1	2	10^{-2} dB	MGDR +final WFF cal	Sigma0 corrected with final WFF calibration.
79	48	143	Sigma0_C	Backscatter coefficient (C)	SI	1	2	10^{-2} dB	MGDR +final WFF cal	Sigma0 corrected with final WFF calibration.
80	49	145	AGC_K	Automatic gain control (Ku)	SI	1	2	10^{-2} dB	MGDR	
81	50	147	AGC_C	Automatic gain control (C)	SI	1	2	10^{-2} dB	MGDR	
82	51	149	AGC_RMS_K	RMS of Automatic gain control (Ku)	SI	1	2	10^{-2} dB	MGDR	
83	52	151	AGC_RMS_C	RMS of Automatic gain control (C)	SI	1	2	10^{-2} dB	MGDR	
84	53	153	AGC_Pts_Avg	Number of valid points used to compute AGC (Ku)	SI	1	1	/	MGDR	Moved here from 56 for byte alignment, consistency with SWH layout.
85	54	154	Atm_At_Sig0_Corr	Atmospheric attenuation correction to sigma0	SI	1	1	10^{-2} dB	MGDR	Treated as SI - no realistic values over 127.
86	55	155	Net_Instr_Sig0_Corr	Net instrument correction to sigma0	SI	1	2	10^{-2} dB	MGDR	(POSEIDON only; TOPEX default)
87	56	157	Net_Instr_AGC_Corr_K	Net instrument correction to AGC (Ku)	SI	1	2	10^{-2} dB	MGDR	Not updated in v3.0
88	57	159	Net_Instr_AGC_Corr_C	Net instrument correction to AGC (C)	SI	1	2	10^{-2} dB	MGDR	Not updated in v3.0
89	X[AGC_Pts_Avg]X					X	[Number of valid points used to compute AGC]X	X	MGDR	Moved to 53 for byte alignment
90	Geophysical Quantity:								36	
91	58	161	H_MSS	Mean sea surface height	SI	1	4	10^{-3} m	MGDR/Jason	Updated to Jason/CLS01 = MGDR + GSFC00.1
92	59	165	H_Geo	Geoid height	SI	1	4	10^{-3} m	MGDR/Jason	MGDR copied from PODAAC/TOPEX. (To be replaced w/ CNES/Jason value.)
93	H_Geo_Xtrk		Cross-track geoid gradient	SI	0	4	10^{-3} m	MGDR/Jason	Will be added when Jason algorithm defined.	
94	60	169	H_EOT_CSR	Elastic ocean tide#1	SI	1	2	10^{-3} m	MGDR	
95	61	171	H_EOT_GOT47	Elastic ocean tide#2	SI	1	2	10^{-3} m	Computed	MGDR replaced w/ GOT 4.7
96	62	173	H_LT	Loading tide effect, Tide#1	SI	1	2	10^{-3} m	MGDR/Jason	Loading tide from TBD[Tide#1]
97	63	175	H_LP_Noneq	Non-equilibrium correction to equilibrium long period tide included in ocean tides	SI	1	2	10^{-3} m	MGDR/Jason	This correction should be added to H_EOT_* as a correction. *Not computed in Rel 3.0 - defaulted. (Will be updated to Jason.)
98	64	177	H_Set	Solid earth tide	SI	1	2	10^{-3} m	MGDR/Jason	
99	65	179	H_Pol	Geocentric pole tide	SI	1	2	10^{-3} m	MGDR	Changed to 2 bytes for alignment, SI.

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100		66	181	H_Ocn_Depth	Ocean depth	SI	1	2	m	MGDR/Jason	MGDR copied from PODAAC/TOPEX. (To be replaced w/ CNES/Jason value.)
101		67	183	IB_Corr_HF	High frequency pressure induced SSH correction	SI	1	2	10^{-3} m	MGDR/Jason	Not updated in Rel 3.0 . (Will be updated to Jason in Rel 3.1.)
102		68	185	Wind_Sp	Wind speed from Jason model for corrected sigma0_K and retracked SWH_K	SI	1	2	0.1 m/s	MGDR/Jason	Jason ver. B from Vandemark et al. model w/ corrected sigma0. (Range= 0 to 250, 255=flag. (Max val in EMB table =20.75) (TOPEX max was 21.73 (=217).) Changed to 2 bytes for alignment. SI.
103		69	187	Spare	For 4 byte alignment	BF	1	2			
104	TMR Brightness Temperatures										
105		70	189	Tb_18	TMR brightness temperature 18 GHz	SI	1	2	10^{-2} deg K	MGDR	MGDR copied from PODAAC/TOPEX. Value from antenna, drift, cal correction after Retracking section.
106		71	191	Tb_21	TMR brightness temperature 21 GHz	SI	1	2	10^{-2} deg K	MGDR	MGDR copied from PODAAC/TOPEX. Value from antenna, drift, cal correction after Retracking section.
107		72	193	Tb_37	TMR brightness temperature 37 GHz	SI	1	2	10^{-2} deg K	MGDR	MGDR copied from PODAAC/TOPEX. Value from antenna, drift, cal correction after Retracking section.
108		73	195	Spare	For 4 byte alignment	BF	1	2	/		
109	Flags									28	
110		74	197	ALTON	Altimeter flag (0=POSEIDON, 1=TOPEX)	BF	1	1	/	MGDR	MGDR copied from PODAAC/TOPEX. Retain splitting of TOPEX flags as on MGDR.
111		75	198	Instr_State_TOPEX	State of TOPEX altimeter	BF	1	1	/	MGDR	
112		76	199	Instr_State_TMR	State of TMR	BF	1	1	/	MGDR	
113		77	200	Instr_State_DORIS	State of DORIS instrument	SI	1	1	/	MGDR	
114		78	201	MANV	Maneuver indicator	BF	1	1	/	MGDR	
115		79	202	Lat_Err	Quality flag of the latitude	BF	1	1	/	Computed	=0 Diff Lat POD#1 - POD#2 < 10 microdeg. =1 Differ > 10 microdeg
116		80	203	Lon_Err	Quality flag of the longitude	BF	1	1	/	Computed	=0 Diff Lon POD#1 - POD#2 < 10 microdeg. =1 Differ > 10 microdeg
117		81	204	Val_Att_Ptf	Platform attitude validity	BF	1	1	/	MGDR	
118		82	205	Current_Mode_1	Altimeter current mode (TOPEX first half frame)	BF	1	1	/	MGDR	
119		83	206	Current_Mode_2	Altimeter current mode (POSEIDON or TOPEX second half frame)	BF	1	1	/	MGDR	
120		84	207	Gate_Index	TOPEX gate index	BF	1	1	/	MGDR	K and C values packed in byte
121		85	208	Ind_Phase	POSEIDON indicator on tracker processing	BF	1	1	/	MGDR	
122		86	209	SSH_Bad	State of 10 per second values	BF	1	2	/	MGDR	MGDR (Poseidon) = Rang, SME
123		87	211	Alt_Bad_1	TOPEX and POSEIDON measurement conditions #1	BF	1	1	/	MGDR	
124		88	212	Alt_Bad_2	TOPEX and POSEIDON measurement conditions #2	BF	1	1	/	MGDR	
125		89	213	Fl_Att	Altitude flag	BF	1	1	/	MGDR	
126		90	214	Dry_Err	Quality flag on Dry_Corr, Dry1_Corr, Dry2_Corr	BF	1	1	/	MGDR	Not computed. (Update to combine MGDRB flags into 1 item.)
127				X Dry1_Err X	Quality flag on Dry1_Corr	SI	1	1	/	MGDR	X Combine MGDRB flag into 1 item: Dry_Corr X
128				X Dry2_Err X	Quality flag on Dry2_Corr	SI	1	1	/	MGDR	X Combine MGDRB flag into 1 item: Dry_Corr X
129		91	215	Wet_Flag	Interpolation flag on Wet_Corr, Wet1_Corr, Wet2_Corr	BF	1	1	/	MGDR	
130		92	216	Wet_H_Err	Quality flag on Wet_Corr, Wet1_Corr, Wet2_Corr	BF	1	1	/	MGDR	
131		93	217	Iono_Bad	Quality flag on Iono_Cor	BF	1	2	/	MGDR	
132		94	219	Iono_Dor_Bad	Quality flag on Iono_Dor	BF	1	1	/	MGDR	
133		95	220	Geo_Bad_1	Ocean/land/ice flag	BF	1	1	/	MGDR	
134		96	221	Geo_Bad_2	Rain/tide flag	BF	1	1	/	MGDR	
135		97	222	TMR_Bad	Brightness temperature flags	BF	1	1	/	TRP	Updated from TMR Replacement Product
136		98	223	Ind_RTK	POSEIDON ground retracking indicator	BF	1	1	/	MGDR	(POSEIDON only; TOPEX default)
137		99	224	Spare	For 4 byte alignment	BF	1	1	/		
138	Field Number	Record Location	Parameter Name			Content	Type	Dim.	Size	Units	Source
139											Comment
140										All Retrack =	<- Byte counts -->
141	Retracking 1 - Least Squares (LSE, Retrk1)									236	44
142		100	225	H_Retrk1_K	One per frame total retracked range correction K band, LSE (includes instrument corrections)	SI	1	4	10^{-3} m	RDR	See RGDR usage notes for application to SSH.
143		101	229	H_Retrk1K_Hi_Rate	10/frame differences from compressed value (H_Retrk1_K) K band, LSE	SI	10	2	10^{-3} m	RDR	Retrack equivalent of H_Alt_Hi_Rate
144		102	249	H_Retrk1K_RMS	RMS from compression from 10 to 1 value per frame K band, LSE	SI	1	2	10^{-3} m	RDR	Retrack equivalent of RMS_H_Alt
145		103	251	SWH_Retrk1_K	Retracked Significant Wave Height K band, LSE	SI	1	2	10^{-2} m	RDR	Retrack equivalent of SWH_K

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146	104	253	Att_Retrk1_K	Retracked attitude^2, K band, LSE	SI	1	2	10^{-4} deg^2	RDR	Retrack equivalent to Att_Wvf. Retracking produces Attitude^2.
147	105	255	Skew_Retrk1_K	Retracked height skewness K band, LSE	SI	1	2	10^{-3}	RDR	Retracked skewness averaged over TBD[20] frames. Note: height.
148	106	257	Scale_Retrk1_K	WF amplitude estimated in retracking K band, LSE	SI	1	2	/	RDR	Could be related to sigma0 with calibration
149	107	259	Noise_Retrk1_K	Noise estimated in retracking K band, LSE	SI	1	2	/	RDR	
150	108	261	Slope_Retrk1_K_compress	Slope of fit used to compress 10/frame values to 1/frame	SI	1	2	0^{-4} m / fram	RDR	Compression fit done with LS bisquare weight
151	109	263	WF_Bad_Retrk1_K	K band WF determined unfittable in Retrak	BF	1	2	/	Computed	Not in Rel 3.0 . Bits 0-9: 0 = OK, 1 = Bad
152	110	265	Nval_Retrk1_K	Number of valid points for 1 second retracked range K band, LSE	SI	1	1	/	Computed	Not in Rel 3.0 . Retrack equivalent of Nval_H_Alt. Number of fittable WF in WF_Bad_Retrk1_K
153	111	266	Spare	4 Byte alignment	BF	3	1	/		
154	112	269	H_Retrk1_C	One per second retracked altimeter range C band, LSE (includes instrument corrections)	SI	1	4	10^{-3} m	RDR	32
155	113	273	H_Retrk1C_Hi_Rate	10/frame Differences from compressed value C band, LSE	SI	5	2	10^{-3} m	RDR	
156	114	283	H_Retrk1C_RMS	RMS from compression from 10 to 1 value per frame, C band, LSE	SI	1	2	10^{-3} m	RDR	
157	115	285	SWH_Retrk1_C	Retracked Significant Wave Height C band, LSE	SI	1	2	10^{-3} m	RDR	
158	116	287	Att_Retrk1_C	Retracked attitude^2, C band, LSE	SI	1	2	10^{-4} deg^2	RDR	Retrack equivalent to Att_Wvf. Retracking produces Attitude^2.
159	117	289	Skew_Retrk1_C	Retracked height skewness C band, LSE	SI	1	2	10^{-3}	RDR	Retracked skewness averaged over TBD[20] frames. Note: height.
160	118	291	Scale_Retrk1_C	WF amplitude estimated in retracking C band, LSE	SI	1	2	/	RDR	
161	119	293	Noise_Retrk1_C	Noise floor estimated in retracking C band, LSE	SI	1	2	/	RDR	
162	120	295	Slope_Retrk1_C_compress	Slope of fit used to compress 10/frame values to 1/frame	SI	1	2	0^{-4} m / fram	RDR	Compression fit done with LS bisquare weight
163	121	297	WF_Bad_Retrk1_C	K band WF determined unfittable in Retrak	BF	1	2	/	Computed	Not in Rel 3.0 . Bits 0-4: 0 = OK, 1 = Bad
164	122	299	Nval_Retrk1_C	Number of valid points for 1 second retracked range C band, LSE	SI	1	1	/	Computed	Not in Rel 3.0 . Retrack equivalent of Nval_H_Alt. Number of fittable WF in WF_Bad_Retrk1_C.
165	123	300	Spare	For 4 byte alignment	BF	1	1	/		
166										
167	Retracking 2 - Maximum A Posteriori Estimate (MAP) - Note: this should be used with care; Retrk1/LSE recommended for most purposes							140		74
168	124	301	H_Retrk2_K	One per frame total retracked range correction K band, MAP (includes instrument corrections)	SI	1	4	10^{-3} m	RDR	See RGDR usage notes for application to SSH.
169	125	305	H_Retrk2K_Hi_Rate	10/frame differences from compressed value (H_Retrk2_K) K band, MAP	SI	10	2	10^{-3} m	RDR	Retrack equivalent of H_Alt_Hi_Rate
170	126	325	H_Retrk2K_RMS	RMS from compression from 10 to 1 value per frame K band, MAP	SI	1	2	10^{-3} m	RDR	Retrack equivalent of RMS_H_Alt
171	127	327	SWH_Retrk2_K	Retracked Significant Wave Height K band, MAP	SI	1	2	10^{-3} m	RDR	Retrack equivalent of SWH_K
172	128	329	Att_Retrk2_K	Retracked attitude^2 K band, MAP	SI	1	2	10^{-4} deg^2	RDR	Retrack equivalent to Att_Wvf. Retracking produces Attitude^2.
173	129	331	Skew_Retrk2_K	Retracked height skewness K band, MAP	SI	1	2	10^{-3}	RDR	Retracked skewness averaged over TBD[20] frames. Note: height.
174	130	333	Scale_Retrk2_K	WF amplitude estimated in retracking K band, MAP	SI	1	2	/	RDR	Could be related to sigma0 with calibration
175	131	335	Noise_Retrk2_K	Noise estimated in retracking K band, MAP	SI	1	2	/	RDR	
176	132	337	Slope_Retrk2_K_compress	Slope of fit used to compress 10/frame values to 1/frame	SI	1	2	0^{-4} m / fram	RDR	Compression fit done with LS bisquare weight
177	133	339	WF_Bad_Retrk2_K	K band WF determined unfittable in Retrak	BF	1	2	/	Computed	Not in Rel 3.0 . Bits 0-9: 0 = OK, 1 = Bad
178	134	341	Nval_Retrk2_K	Number of valid points for 1 second retracked range K band, MAP	SI	1	1	/	Computed	Not in Rel 3.0 . Retrack equivalent of Nval_H_Alt. Number of fittable WF in WF_Bad_Retrk1_K
179	135	342	Spare	4 Byte alignment	BF	1	1	/		
180	136	343	H_Retrk2_C	One per frame retracked altimeter range C band, MAP	SI	1	4	10^{-3} m	RDR	
181	137	347	H_Retrk2C_Hi_Rate	10/frame Differences from compressed value C band, MAP	SI	5	2	10^{-3} m	RDR	
182	138	357	H_Retrk2C_RMS	RMS from compression from 10 to 1 value per frame, C band, MAP	SI	1	2	10^{-3} m	RDR	
183	139	359	SWH_Retrk2_C	Retracked Significant Wave Height C band, MAP	SI	1	2	10^{-3} m	RDR	
184	140	361	Att_Retrk2_C	Retracked attitude^2, C band, MAP	SI	1	2	10^{-4} deg^2	RDR	Retrack equivalent to Att_Wvf. Retracking produces Attitude^2.
185	141	363	Skew_Retrk2_C	Retracked height skewness C band, MAP	SI	1	2	10^{-3}	RDR	Retracked skewness averaged over TBD[20] frames. Note: height.
186	142	365	Scale_Retrk2_C	WF amplitude estimated in retracking C band, MAP	SI	1	2	/	RDR	
187	143	367	Noise_Retrk2_C	Noise floor estimated in retracking C band, MAP	SI	1	2	/	RDR	
188	144	369	Slope_Retrk2_C_compress	Slope of fit used to compress 10/frame values to 1/frame	SI	1	2	0^{-4} m / fram	RDR	Compression fit done with LS bisquare weight
189	145	371	WF_Bad_Retrk2_C	K band WF determined unfittable in Retrak	BF	1	2	/	X[Computed]X	Not in Rel 3.0 . Bits 0-4: 0 = OK, 1 = Bad

A	B	C	D	E	F	G	H	I	J	K
190		146	373	Nval_Retrk2_C Number of valid points for 1 second retracked range C band, MAP	SI	1	1	/	X[Computed]X	Not in Rel 3.0 . Retrack equivalent of Nval_H_Alt. Number of fitable WF in WF_Bad_Retrk1_C.
191		147	374	Spare 4 Byte alignment	BF	1	1	/		
192		148	375	H_Retrk2K_std Std dev of one per second retracked altimeter range K band, MAP	SI	1	4	10^{-3} m		RDR not computed - defaulted.
193		149	379	H_Retrk2K_Hi_Rate_std Std dev of 10/frame height fit K band, MAP	SI	10	2	10^{-3} m		RDR not computed - defaulted.
194		150	399	SWH_Retrk2K_std Std dev of Retracked Significant Wave Height K band, MAP	SI	1	2	10^{-3} m		RDR not computed - defaulted.
195		151	401	Att_Retrk2K_std Std dev of Retracked attitude^2 K band, MAP	SI	1	2	10^{-4} deg^2		RDR not computed - defaulted.
196		152	403	Skew_Retrk2K_std Std dev of Retracked [height/range] skewness K band, MAP	SI	1	2	10^{-3}		RDR not computed - defaulted.
197		153	405	scale_Retrk2K_std Std dev of WF amplitude estimated in retracking K band, MAP	SI	1	2	/		RDR not computed - defaulted.
198		154	407	noise_Retrk2K_std Std dev of Noise estimated in retracking K band, MAP	SI	1	2	/		RDR not computed - defaulted.
199		155	409	Spare 4 Byte alignment	BF	1	2	/		RDR not computed - defaulted.
200		156	411	H_Retrk2C_std Std dev of one per second retracked altimeter range C band, MAP	SI	1	4	10^{-3} m		RDR not computed - defaulted.
201		157	415	H_Retrk2C_Hi_Rate_std Std dev of 10/frame height fit K band, MAP	SI	5	2	10^{-3} m		RDR not computed - defaulted.
202		158	425	SWH_Retrk2C_std Std dev of Retracked Significant Wave Height K band, MAP	SI	1	2	10^{-3} m		RDR not computed - defaulted.
203		159	427	Att_Retrk2C_std Std dev of Retracked attitude^2 K band, MAP	SI	1	2	10^{-4} deg^2		RDR not computed - defaulted.
204		160	429	Skew_Retrk2C_std Std dev of Retracked [height/range] skewness K band, MAP	SI	1	2	10^{-3}		RDR not computed - defaulted.
205		161	431	Scale_Retrk2C_std Std dev of WF amplitude estimated in retracking K band, MAP	SI	1	2	/		RDR not computed - defaulted.
206		162	433	Noise_Retrk2C_std Std dev of Noise estimated in retracking C band, MAP	SI	1	2	/		RDR not computed - defaulted.
207		163	435	Retrk2_use_prior_K Bits indicating that prior value, stdev used in MAP fit	BF	1	1	/	Computed	Not in Rel 3.0 . 0=Not used, 1=Used. Bits 0-4: Scale, Range, SWH, Skew, Attitude.
208		164	436	Retrk2_use_prior_C Bits indicating that prior value, stdev used in MAP fit	BF	1	1	/	Computed	Not in Rel 3.0 . 0=Not used, 1=Used. Bits 0-4: Scale, Range, SWH, Skew, Attitude.
209		165	437	Spare For 4 byte alignment	BF	1	4	/		
210										
211		Computations from Retracking							20:Bytes	
212		166	441	GDR_Rec_Num Record number in MGDR used in Retracking	SI	1	2	/	RDR	Should be same as current record number in this file
213		167	443	SDR_Rec_Num Record number in SDR used in Retracking	SI	1	2	/	RDR	To ease retracking by others. Time match to GDR record.
214		168	445	Net_Instr_Corr_Retrk_K Net Instrument Range Correction to use with retracking	SI	1	2	10^{-3} m	RDR	K band net instrument range correction included in retracked ranges = oscillator + Doppler_Retrack + track_mode + calibration. Accel not needed for retracking. Doppler computed from orbit and MSS (not altimeter range) to reduce noise.
215		169	447	Net_Instr_Corr_Retrk_C Net Instrument Range Correction to use with retracking	SI	1	2	10^{-3} m	RDR	C band net instrument range correction included in retracked ranges = oscillator + Doppler_Retrack + track_mode + calibration. Accel not needed for retracking. Doppler computed from orbit and MSS (not altimeter range) to reduce noise.
216				X[Doppler_Corr_Retrack]X Doppler correction to range	SI	0	2	10^{-3} m		[Included in net_instr_corr_retrk. New estimate from orbit and MSS.]
217				X[Accel_Corr]X Acceleration correction to Tracker Range	SI	0	2	10^{-3} m		[Not needed with retrack]
218		170	449	Iono_Retrk Iono computed with retracking values, corrections	SI	1	2	10^{-3} m	Computed	Uses updated EMB KC Adj (next item)
219		171	451	EMB_KC_Adj New EMB model, combined KC	SI	1	2	10^{-3} m	Computed	Walsh EMB model (not new retrk SSB) adjusted w/ Retrk_SWH, may be different for Alt-A, Alt-B.
220		172	453	SSH_Bad_Retrk TOPEX SSH_Bad revised with Retrak information	BF	1	2	/	[Computed]	Not in Rel 3.0 - defaulted.
221		173	455	Retrk_Quality Flag giving Retrak quality information	BF	1	1	/	[Computed]	Not in Rel 3.0 - defaulted. [Bits shown below.]
222		174	456	Alt_Bad1_Retrk Alt_Bad1 revised with Retrak information	BF	1	1	/	[Computed]	Not in Rel 3.0 - defaulted.
223		175	457	Geo_Bad2_new Geo_Bad2 flag revised for new computation	BF	1	1	/	[Computed]	Not in Rel 3.0 - defaulted. [Bits shown below.]
224		176	458	SWH_Comp_K Significant Wave Height K computed from EMB_K	SI	1	2	10^{-2} m	[Computed]	Not in Rel 3.0 - defaulted. [Computed to get improved precision, still quantized to 4 mm.]
225		177	460	Spare For 4 byte alignment	BF	1	1	/		
226										
227		TMR Replacement Product (TRP)							20:< Updated TMR bytes	
228		178	461	Wet_H_Rad_Corr Corrected Wet H_Rad from new Tb18, Tb21, Tb37	I	1	2	10^{-4} m	TRP	Uses along track avg of corrected Tbs. (Note: 0.1mm)
229		179	463	Tb18_Corr Recalibrated Tb18	SI	1	2	0.01K	TRP	No along track avg.
230		180	465	Tb21_Corr Recalibrated Tb21	SI	1	2	0.01K	TRP	No along track avg.
231		181	467	Tb37_Corr Recalibrated Tb37	SI	1	2	0.01K	TRP	No along track avg.

A	B	C	D	E	F	G	H	I	J	K
Field Number	Start Byte	Parameter Name		Content	Type	Dim.	Size	Units	Source	Comment
232	182	469	Atm_Att_Sig0_Corr_ku	Atmospheric attenuation correction for Ku backscatter coefficient	SI	1	2	0.01 dB	TRP	
233	183	471	Atm_Att_Sig0_Corr_C	Atmospheric attenuation correction for C backscatter coefficient	SI	1	2	0.01 dB	TRP	Missing from original TOPEX GDR
234	184	473	rad_water_vapor	Radiometer water vapor content	SI	1	2	0.01 g/cm^2	TRP	May be deleted in final product.
235	185	475	rad_liquid_water	Radiometer liquid water content	SI	1	2	0.01 g/cm^2	TRP	May be deleted in final product.
236	186	477	Spare	For 4 byte alignment	BF	1	4	/		
237										
238										
239										
240										
241			Retrk_Quality	Bit= 0 indicates test was done and data passed. =1 indicates test not done or data failed. Spare bits =0. Used bits initialized to 1						
242			:bit0	0= RDR found and OK. 1=Bad/Missing						
243			:bit1	0= rdrA_SSH_Bad = gdr_SSH_Bad (same). 1= pt changes in SSH_Bad						
244			:bit2	0= rdrA_Alt_Bad1 = gdr_Alt_Bad1 (same). 1= changes in rdr						
245			:bit3	0= calculation of swh_new from emb OK. 1= Not						
246			:bit4	0= retrack K ChiSq < retrack K ChiSq limit. 1= Not						
247			:bit5	0= retrack C ChiSq < retrack C ChiSq limit. 1= Not						
248			:bit6	Spare (0)						
249			:bit7	Spare (0)						
250										
251			Geo_Bad2_new							
252			:bit0	TOPEX rain flag from recalc with corrected Tb18_g1257						
253			:bit1	New TOPEX rain flag different than original TOPEX rain flag (Geo_Bad bit 3) (0= No, 1= Yes)						
254			:bit2	Jason rain flag using K-C sigma0 diff and liquid water						
255			:bit3	Jason ice flag						
256			:bit4	Jason tide1_GOT00.2 0= OK.. 1= Not available						
257			:bit5	spare						
258			:bit6	Jason tide2, FES2004, 2-bit (b6,b7) flag based on number grid pts found. 0= 4 pts used						
259			:bit7	Jason tide2 flag (cont'd). 1(10)= 3 pts. 2(01)= 1 or 2 pts. 3(11)= out of gridded area						